Context Description: Posted Dec. 1, 2006

This draft report was prepared by NIST staff at the request of the Technical Guidelines Development Committee (TGDC) to serve as a point of discussion at the Dec. 4-5 meeting of the TGDC. Prepared in conjunction with members of a TGDC subcommittee, the report is a discussion draft and does not represent a consensus view or recommendation from either NIST or the TGDC. It reflects the conclusions of NIST research staff for purposes of discussion. The TGDC is an advisory group to the Election Assistance Commission, which produces voluntary voting system guidelines and was established by the Help America Vote Act. NIST serves as a technical advisor to the TGDC.

The NIST research and the draft report's conclusions are based on interviews and discussions with election officials, voting system vendors, computer scientists, and other experts in the field, as well as a literature search and the technical expertise of its authors. It is intended to help in developing guidelines for the next generation of electronic voting machine to ensure that these systems are as reliable, accurate, and secure as possible. Issues of certification or decertification of voting systems currently in place are outside the scope of this document and of the TGDC's deliberations.

Voter's Choice Issues

Version date: May 24, 2006

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1. Introduction

There are a number of questions surrounding the issue of what happens when a voter submits an under- and/or over-voted ballot. HAVA has some general requirements that the voter be allowed to correct errors. The VVSG describes equipment behavior in greater detail. Here are the relevant requirements:

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I.2.3.3.2  Paper-based System Requirements

... all paper-based precinct count systems shall:

e. Provide feedback to the voter that identifies specific contests
for which he or she has made no selection or fewer than the allowable
number of selections (e.g., undervotes)

f. Notify the voter if he or she has made more than the allowable
number of selections for any contest (e.g., overvotes)

g. Notify the voter before the ballot is cast and counted of the
effect of making more than the allowable number of selections for
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a contest

h. Provide the voter opportunity to correct the ballot for either an undervote or overvote before the ballot is cast and counted

I.2.3.3.3 DRE System Requirements

...DRE systems shall: ...

e. Indicate to the voter when no selection, or an insufficient number of selections, has been made for a contest (e.g., undervotes)

f. Notify the voter if he or she has made more than the allowable number of selections for any contest (e.g., overvotes)

g. Notify the voter before the ballot is cast and counted of the effect of making more than the allowable number of selections for a contest

h. Provide the voter opportunity to correct the ballot for either an undervote or overvote before the ballot is cast and counted

I.3.1.2 Functional Capabilities

a. The voting system shall provide feedback to the voter that identifies specific contests or ballot issues for which he or she has made no selection or fewer than the allowable number of selections (e.g., undervotes)

b. The voting system shall notify the voter if he or she has made more than the allowable number of selections for any contest (e.g., overvotes)

c. The voting system shall notify the voter before the ballot is cast and counted of the effect of making more than the allowable number of selections for a contest

d. The voting system shall provide the voter the opportunity to correct the ballot for either an undervote or overvote before the ballot is cast and counted

e. The voting system shall allow the voter, at his or her choice, to submit an undervoted ballot without correction

I.4.1.5.1.d Paper-based precinct count requirements

iii. In response to a ballot with an overvote the system shall:

   - Provide a capability to identify an overvoted ballot

   - Return the ballot

   - Provide an indication prompting the voter to examine the ballot

   - Allow the voter to correct the ballot

   - Provide a means for an authorized election official to deactivate

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     this capability entirely and by contest

iv. In response to a ballot with an undervote, the system shall:

   - Provide a capability to identify an undervoted ballot

   - Return the ballot

   - Provide an indication prompting the voter to examine the ballot

   - Allow the voter to correct the ballot

   - Allow the voter to submit the ballot with the undervote

   - Provide a means for an authorized election official to deactivate
     this capability
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The thrust of the requirements is that it is the *voter* (not the poll worker) who decides how to handle certain anomalous situations. In particular, when the voting system detects and warns about potential ballot errors such as undervoting and overvoting, the voter decides whether to attempt to correct the ballot or to submit it as is. We explain below how this general approach is worked out in detail.

Note that the relevant VVSG specifications are currently spread out over three sections (2.3.3, 3.1.2, and 4.1.5.1), so some reorganization is in order no matter what policy is adopted.

2. Dimensions of Analysis

There are at least five dimensions within which the problem can be understood:

1. **Equipment:** Editable interface (DRE et al) vs. precinct opscan vs. central count
2. **Event:** overvote vs. undervote vs. blank ballot page (paper)
3. **Response:** silence vs. warning only vs. allow correction vs. prevention
4. **Configuration:** configurable by election officials vs. hard-coded
5. **Autonomy:** voter can accept/change ballot with vs. without poll worker assistance

Fortunately, the range of plausible behavior is narrower than all the implied possibilities.

3. Editable Interfaces

The major advantage of DREs and other editable devices (such as electronic paper-ballot markers) is that the voter can easily modify his/her choices before final casting of the ballot. The common practice among DREs is to *prevent* overvoting and to *warn and allow correction* of undervoting.

An early draft of the VVSG appeared to require systems to allow overvoting, and some have also interpreted HAVA that way. We believe this is a misreading. A provision to this effect was stricken in the final version of the VVSG. Note also that the vast majority of DREs would be non-compliant if the ability to overvote were required.

On the other hand, neither does *prevention* of overvotes appear to be mandated by HAVA or the current VVSG, although there seems to be no good reason why this should not be so, since it is easily and commonly implemented, and since allowing deliberate overvoting does not add value. Nor does there seem to be any reason or precedent for allowing officials to alter this behavior. Finally, there is no reason why poll worker assistance would be required. (Of course, voters may request assistance.)

Likewise for the commonly implemented strategy for undervoting: warn the voter, allow change, but accept undervotes at the voter's choice.

We conclude that the common behavior of DREs and other editable interfaces is the correct one and should be made part of the VVSG.

RECOMMENDATION: Such devices:

- must prevent overvotes (not merely warn and allow correction, as in current VVSG).
- must warn the voter of undervoting, and allow the voter to correct the undervotes, or submit the ballot as is.
- must not be configurable by officials so as to alter this behavior.
- must not require poll worker assistance to implement this behavior.

4. Manually Marked Paper Ballots

Manually Marked Paper Ballots (MMPB) present greater difficulties than editable interfaces. Let us first deal with the case of MMPBs used with a central counter. Since there is no automated processing at the time of the voting session, the paper is simply accepted as is and no warnings can be issued. HAVA explicitly allows for this case and it is not feasible to require more.

RECOMMENDATION: Central count systems are not required to issue per-ballot warnings about overvotes or undervotes. General instructions inform voters of the effect of over- or under-voting.

This leaves us with the case of precinct count systems, in which the voter manually marks the ballot and then the ballot is submitted to a scanner. The current VVSG says that the warning strategy is very much up to local officials. Election officials may set the system to silently accept or warn of either undervotes or overvotes (independent choice).

Somewhat anomalously, the VVSG requires that these warnings be specific to the contests in question in the case of undervotes (2.3.3.2.e and 3.1.2.a), but not overvotes.

The VVSG requires that, if warned, voters be allowed to submit the paper ballot as is or to correct it (although these specifications are spread out through various sections). There is no requirement that the voter be able to do this without assistance. Indeed, in the case of correcting an overvoted ballot, a poll worker would almost surely intervene since a new blank ballot is needed.

Finally, the VVSG does not currently require the ability to prevent overvotes (either by scanners or DREs).

Aside from the discrepancy about the specificity of the warning of under- and over-voting, the existing requirements make sense, assuming that we want to continue to allow election officials to set the sensitivity of the scanners.

RECOMMENDATION: Precinct scanners:

- must be capable, in the case of either under- or overvoting, of warning about the specific contests in question and allowing the voter to either accept the ballot as is or to correct it. Poll worker assistance may be needed.
- must allow election officials to set the equipment to silently accept overvotes.
- must allow election officials to set the equipment to silently accept undervotes.